

WHAT IS CLAIMED IS:

1. A radiation image pick-up device for performing image pick-up by using radiation, comprising:
 - 5 a plurality of input pixels, each having a wavelength converter for converting incident radiation into light, conversion means for converting the incident radiation and the light converted by the wavelength converter into charge, storage means for storing the converted charge, and read means for reading a signal corresponding to the charge stored in the charge storage means; and
 - 10 a plurality of output lines for outputting charges read from the input pixels, which are connected with the plurality of input pixels.

2. A radiation image pick-up device according to claim 1, further comprising first reset means for resetting the charge in the charge storage means.

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3. A radiation image pick-up device according to claim 2, wherein the plurality of input pixels, the output lines, and the first reset means are respectively formed on an insulating substrate, the first reset means includes a reset thin film transistor, and each of the input pixels includes a read thin film transistor.

4. A radiation image pick-up device according to claim 3, wherein the reset thin film transistor and the read thin film transistor are made of non-single crystalline semiconductor.

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5. A radiation image pick-up device according to claim 1, further comprising a transparent electrode which is located between the wavelength conversion means and the charge conversion means and transmits the 10 light converted by the wavelength conversion means.

6. A radiation image pick-up device according to claim 1, wherein the charge conversion means has a semiconductor substrate for converting radiation into 15 charge and a plurality of divided electrodes provided in correspondence with the plurality of input pixels formed on an insulating substrate, the semiconductor substrate and the insulating substrate are laminated, and the plurality of divided electrodes and storage 20 capacitors of the plurality of pixels are electrically connected with each other.

7. A radiation image pick-up device according to claim 6, wherein the semiconductor substrate is divided 25 into plural regions.

8. A radiation image pick-up device according to

claim 1, further comprising amplifiers for signal amplification in the output lines.

9. A radiation image pick-up device according to
5 claim 1, wherein the charge conversion means is formed
in a semiconductor substrate and has a pn junction
portion.

10. A radiation image pick-up device according to
claim 1, wherein the charge conversion means has an
energy band gap with a band gap of at least 1 eV or
larger.

11. A radiation image pick-up device according to
15 claim 2, further comprising a second reset means for
resetting the output lines, which is connected with the
output lines.

12. A radiation image pick-up device according to
20 claim 1, wherein the read means is composed of a thin
film transistor, and the thin film transistor is made
of non-single crystalline semiconductor.

13. A radiation image pick-up device according to
25 claim 1, wherein the charge storage means and the read
means are formed on the insulating substrate in the
same layer structure having a lower electrode, a

dielectric film, a high resistance semiconductor layer, a low resistance semiconductor layer, and an upper electrode.

5 14. A radiation image pick-up device according to
claim 1, wherein the charge conversion means is made of
semi-insulating semiconductor.

10 15. A radiation image pick-up device according to
claim 1, wherein the wavelength conversion means
includes a phosphor.

15 16. A radiation image pick-up device according to
claim 15, further comprising a reflective layer on a
radiation incident side of the wavelength conversion
means.

20 17. A radiation image pick-up device according to
claim 1, wherein a thickness of a high concentration
impurity region composing the charge conversion means
is set to be 1/5 of an absorption ratio or less.